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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/467,544 | 12/10/1999 | KATHRIN BERKNER | 74451.P103 | 2523 |
| 7590 03/18/2005 | | | | |
| MICHAEL J MALLIE BLAKELY SOKOLOFF TAYLOR & ZAFMAN LLP 12400 WISHIRE BOULEVARD 7TH FLR LOS ANGELES, CA 90025 | | EXAMINER PERUNGAVOOR, SATHYANARAYA V | | |
| | | ART UNIT 2625 | | PAPER NUMBER |

DATE MAILED: 03/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|--------------------------------------|---|--|
| Office Action Summary | Application No. 09/467,544 | Applicant(s) BERKNER, KATHRIN | |
| | Examiner Sath Perungavoor | Art Unit 2625 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 December 1999.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-87 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5,8-37,40-55,58-70,73-77,80-83,86 and 87 is/are rejected.
- 7) ☒ Claim(s) 6, 7, 38, 39, 56, 57, 71, 72, 78, 79, 84 and 85 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>5/14/01, 8/12/02, 9/22/03</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claim 24 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claim 24 states "The method defined in **claim 24**", this claim is dependent on it self. The Examiner has modified this claim for examining purposes as for this office action. The modified statement reads as follows, "The method defined in **claim 2**".

2. The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not).

Misnumbered claim 82 been renumbered 81.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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3. Claims 8, 40, 58, 73 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 8, the following statement is erred “results in sharpening of coefficients for scale dependent parameters less than the **threshold** value”. The Examiner has modified the claim for examining purposes as for this office action. Modified statement reads as follows, “results in sharpening of coefficients for scale dependent parameters less than the **transition** value”.

Regarding claim 40, the following statement is erred “results in sharpening of coefficients for scale dependent parameters less than the **threshold** value”. The Examiner has modified the claim for examining purposes as for this office action. Modified statement reads as follows, “results in sharpening of coefficients for scale dependent parameters less than the **transition** value”.

Regarding claim 58, the following statement is erred “results in sharpening of coefficients for scale dependent parameters less than the **threshold** value”. The Examiner has modified the claim for examining purposes as for this office action. Modified statement reads as follows, “results in sharpening of coefficients for scale dependent parameters less than the **transition** value”.

Regarding claim 73, the following statement is erred “results in sharpening of coefficients for scale dependent parameters less than the **threshold** value”. The Examiner has modified the claim for examining purposes as for this office action. Modified statement reads as follows, “results in sharpening of coefficients for scale dependent parameters less than the **transition** value”.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Vuylsteke [US 5,644,662].

Regarding claim 1, Vuylsteke discloses all the claim limitations, as follows:

A method comprising (Fig. 4):

receiving input data (Fig. 4); and

performing multi-scale unsharp masking on the input data

(Fig. 4; b_0 - b_{L-1} and g_L are the multi-scale unsharp values.).

5. Claims 2-5, 10, 13, 16-20, 27-37, 47-55, 60, 66-70, 75-77 are rejected under 35 U.S.C. 102(b) as being anticipated by Boccignone et al. (“Boccignone”) [NPL document, refer to PTO-892].

Regarding claim 2, Boccignone discloses all the claim limitations, as follows:

A method for processing input data comprising:

decomposing the input data into a plurality of decomposition levels by applying a wavelet transform to the input data (Page 2789 Equation 4; Equation 4 discloses the wavelet transform decomposition.) and

modifying coefficients in at least two of the plurality of decomposition levels by scaling coefficients in the at least two decomposition levels using different scale dependent parameters for each of the decomposition levels (Page 2790 Column 1 Line 1; $\psi(x,y)$ is scale dependent as it can be seen from 2^{-2j} factor, where j is scale dependent.).

Regarding claim 3, Boccignone discloses all the claim limitations, as follows:

The method defined in Claim 2 wherein the input data comprises image data (Title).

Regarding claim 4, Boccignone discloses all the claim limitations, as follows:

The method defined in Claim 2 wherein only wavelet coefficients are scaled (Page 2790 Column 1, Line 1; $\psi(x,y)$ is the wavelet coefficients scaled by 2^{-2j} factor.).

Regarding claim 5, Boccignone discloses all the claim limitations, as follows:

The method defined in Claim 2 wherein modifying coefficients comprises multiplying each coefficient in one of the decomposition levels by a first scale dependent parameter and multiplying each coefficient in another of the decomposition levels by a second scale dependent parameter (Page 2790 Equation 5; k_j and u_j are scale dependent.).

Regarding claim 10, Boccignone discloses all the claim limitations, as follows:

The method defined in Claim 2 wherein the transform comprises a critically sampled discrete wavelet transform (Page 2789 Equation 4; Disclosed is the wavelet transform for images that would be the discrete wavelet transform.).

Regarding claim 13, all claimed limitations are set forth and rejected as per discussion for claim 10.

Regarding claim 16, Boccignone discloses all the claim limitations, as follows:

The method defined in Claim 2 further comprising selecting the scale dependent parameter based on knowledge of the input data and knowledge of the image source (Page 2790 Column 1

Paragraph 3; Disclosed reference takes into account the luminance values of the images.).

Regarding claim 17, Boccignone discloses all the claim limitations, as follows:

The method defined in Claim 16 wherein the knowledge of the image source comprises a model point spread function of the image source (Page 2790 Column 1 Paragraph 3; Disclosed 'C' could be graphed to show the point spread.).

Regarding claim 18, Boccignone discloses all the claim limitations, as follows:

The method defined in Claim 16 wherein the knowledge of the data comprises an indication the data contains step edges (Page 2790 Column 1 Paragraph 3; Disclosed 'C' indicates the contrast, so the edge information.).

Regarding claim 19, Boccignone discloses all the claim limitations, as follows:

The method defined in claim 16 wherein selecting the scale dependent parameter is based on an estimate of decay of wavelet coefficients across scales (Page 2790 Column 1 Equation 1; Scale dependent parameter is based on the g_j across scales.).

Regarding claim 20, Boccignone discloses all the claim limitations, as follows:

The method defined in Claim 2 further comprising performing an inverse transform on coefficients after scaling has been performed (Page 2789 Equation 4; It would also be inherent to perform inverse wavelet transform after performing needed modifications through wavelet transform. Since the main purpose of wavelet transform is to aid in analysis, but inverse transform must be performed to return to the spatial domain.).

Regarding claim 27, Boccignone discloses all the claim limitations, as follows:

The method defined in Claim 2 wherein the different scale dependent parameters are based on desired smoothness and sharpness (Page 2790 Column 1 Paragraphs 1 and 3; $C(x,y,t)$ is the sharpness function and $\phi(x,y)$ is the smoothing function, both can be set to desirable levels.).

Regarding claim 28, Boccignone discloses all the claim limitations, as follows:

The method defined in Claim 2 further comprising renormalizing coefficients (Page 2790 Equation 5; k_j performs the normalization.).

Regarding claim 29, Boccignone discloses all the claim limitations, as follows:

The method defined in Claim 28 wherein renormalizing coefficients comprises applying a scalar to coefficients in at least one decomposition level (Page 2790 Equation 5; k_j is a scalar coefficient.).

Regarding claim 30, Boccignone discloses all the claim limitations, as follows:

The method defined in Claim 28 wherein renormalizing coefficients is performed as part of scaling coefficients by multiplying all coefficients in one of the decomposition levels by a scale dependent parameter chosen to achieve renormalization (Page 2790 Equation 5; k_j performs the normalization and it is dependent on scale j .).

Regarding claim 31, Boccignone discloses all the claim limitations, as follows:

The method defined in Claim 28 wherein renormalizing coefficients is performed as part of scaling coefficients by computing a range of wavelet coefficients before rescaling, performing rescaling, and then scaling modified coefficients back to the range before rescaling (Page 2790 Equation 5; k_j performs the normalization and it is dependent on scale j , whose range is known by the level or scales desired by the user.).

Regarding claim 32, Boccignone discloses all the claim limitations, as follows:

The method defined in Claim 2 wherein the scale dependent parameters comprise monotonic functions (Page 2790; Page 2790 Column 1, Line 1; 2^{-2j} is a monotonic function.).

Regarding claim 33, Boccignone discloses all the claim limitations, as follows:

The method defined in Claim 2 further comprising classifying wavelet coefficients into types (Page 2790 Column 1 Paragraph 3; Classification is done between target and background.).

Regarding claim 34, Boccignone discloses all the claim limitations, as follows:

The method defined in Claim 33 wherein the types comprise text and background (Page 2790 Column 1 Paragraph 3; Classification is done between target (text) and background.).

Regarding claims 35-37 and 47-49, all claimed limitations are set forth and rejected as per discussion for claims 2-5, 10, 13, 16-20, 27-34.

Regarding claims 50-52, all claimed limitations are set forth and rejected as per discussion for claims 2 and 33-34.

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Regarding claims 53-55, all claimed limitations are set forth and rejected as per discussion for claims 2, 3 and 5.

Regarding claim 60, all claimed limitations are set forth and rejected as per discussion for claim 20.

Regarding claims 66-68, all claimed limitations are set forth and rejected as per discussion for claims 28-30.

Regarding claims 69-70, all claimed limitations are set forth and rejected as per discussion for claims 2 and 5.

Regarding claims 75-77, all claimed limitations are set forth and rejected as per discussion for claims 2, 3, 5 and 20.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 8-9, 40-41, 58-59, 73-74, 80-81 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boccignone in view of Shimizu [US 5,774,578].

Regarding claim 8, Boccignone discloses the claim limitations as set forth in the discussion for claim 2.

Boccignone does not explicitly disclose the following claim limitations:

The method defined in Claim 2 wherein modifying coefficients results in smoothing of coefficients for scale dependent parameters greater than a transition value and results in sharpening of coefficients for scale dependent parameters less than the transition value.

However, in the same field of endeavor Shimizu discloses the deficient claim limitations, as follows:

Performing sharpening operation for parameter values greater than a transition value and smoothing for parameter values less than the transition value (Column 2 Lines 30-33).

It would have been obvious to one with ordinary skill in the art at the time of invention to modify the teachings of Boccignone with Shimizu to further meet the claim limitations, as follows:

Boccignone discloses coefficients that are scale dependent and used in sharpening (Title and discussion for claims 2-5).

Shimizu discloses parameters that determine scaling and smoothing (Column 2 Lines 30-33).

One could effortlessly combine both teachings in order to meet all the claim limitations, since this would be an inherent modification to perform smoothing with Boccignone's invention. It is well known that multiresolution processing involves smoothing with downsampling and sharpening with upsampling.

Regarding claim 9, Boccignone discloses the claim limitations as set forth in the discussion for claim 8.

Boccignone does not explicitly disclose the following claim limitations:

The method defined in Claim 8 wherein the transition value is 1.

It would have been obvious to one with ordinary skill in the art at the time of invention to set the transition value to 1, since downsampling would be associated with resolution reduction (i.e. modified number samples/original number samples < 1) and upsampling would be associated with increased resolution (i.e. modified number samples/original number samples > 1).

Regarding claims 40-41, 58-59, 73-74 and 80-81, all claimed limitations are set forth and rejected as per discussion for claims 8-9.

7. Claims 11-13, 14, 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boccignone in view of Vetterli et al. ("Vetterli") [NPL document, refer to PTO-892].

Regarding claim 11, Boccignone discloses the claim limitations as set forth in the discussion for claim 2.

Boccignone does not explicitly disclose the following claim limitations:

The method defined in Claim 2 wherein the transform comprises an overcomplete discrete wavelet transform. However, in the same field of endeavor Vetterli discloses the deficient claim limitations, as follows:

Vetterli discloses overcomplete discrete wavelet transform (Page 171 Paragraph 4).

It would have been obvious to one with ordinary skill in the art at the time of invention to modify the teachings of Boccignone with Vetterli to further meet the claim limitations, as follows:

Vetterli discloses overcomplete discrete wavelet transform to be used in order to obtain "superior quality than those in critically sampled systems".

One could effortlessly combine both teachings in order to meet all the claim limitations, since improved quality on Boccignone's invention can be achieved through Vetterli's disclosure.

Regarding claim 12, Boccignone discloses the claim limitations as set forth in the discussion for claim 2.

Boccignone does not explicitly disclose the following claim limitations:

The method defined in Claim 2 wherein the transform comprises a complex wavelet transform.

However, in the same field of endeavor Vetterli discloses the deficient claim limitations, as follows:

Vetterli discloses complex wavelet transform (Page 183 Paragraph 2).

It would have been obvious to one with ordinary skill in the art at the time of invention to modify the teachings of Boccignone with Vetterli to further meet the claim limitations, as follows:

Vetterli discloses complex wavelet transform to be used in order to provide multidimensionality.

One could effortlessly combine both teachings in order to meet all the claim limitations, since multidimensional enablement of

Boccignone's invention can be achieved through Vetterli's disclosure.

Regarding claim 14, all claimed limitations are set forth and rejected as per discussion for claim 11.

Regarding claim 15, all claimed limitations are set forth and rejected as per discussion for claim 11.

8. Claims 21-26, 42-46, 61-65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boccignone in view of Choi et al. ("Choi") [NPL document, refer to PTO-892].

Regarding claim 21, Boccignone discloses the claim limitations as set forth in the discussion for claim 2.

Boccignone does not explicitly disclose the following claim limitations:

The method defined in Claim 2 further comprising
denoising after applying the wavelet transform.

However, in the same field of endeavor Choi discloses the deficient claim limitations, as follows:

The method defined in Claim 2 further comprising
denoising after applying the wavelet transform (Page 596

Column 1 Paragraph 3 and Page 598 Column 2 Paragraph 1).

It would have been obvious to one with ordinary skill in the art at the time of invention to modify the teachings of Boccignone with Choi to further meet the claim limitations, as follows:

Choi discloses wavelet transform and scaling coefficients that are scale dependent used in denoising (Page 596 Column 1 Paragraph 3).

Boccignone discloses denoising, wavelet transform and scaling coefficients that are scale dependent used in image enhancement (Page 2790 Column 1 Paragraph 1).

One could effortlessly combine both teachings in order to meet all the claim limitations, since both Boccignone and Choi disclose denoising and Choi discloses a different method to arrive at Boccignone's results.

Regarding claim 22, Choi discloses all the claim limitations, as follows:

The method defined in Claim 21 further comprising performing denoising as part of scaling coefficients by multiplying all coefficients in one of the decomposition levels above a predetermined threshold and setting other coefficients to a value near zero (Page 598 Column 2 Paragraph 5; Figure 1 f; Cited

reference discloses thresholding method for denoising. Hard thresholding would meet this feature.).

Regarding claim 23, Choi discloses all the claim limitations, as follows:

The method defined in Claim 22 wherein the value is zero (Page 598 Column 2 Paragraph 5; Figure 1 f; Hard thresholding would have the value at zero.).

Regarding claims 24-25, all claimed limitations are set forth and rejected as per discussion for claims 21-23.

Regarding claim 26, Choi discloses all the claim limitations, as follows:

The method defined in Claim 21 further comprises coloring noise that remains after scaling coefficients (Figure 1 d; Cited reference discloses remaining the noise.).

Regarding claims 42-46, all claimed limitations are set forth and rejected as per discussion for claims 21-26.

Regarding claims 61-65, all claimed limitations are set forth and rejected as per discussion for claims 21-25.

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Regarding claims 82-83 and 86-87, it well known that the copiers have image source and a classifier unit coupled to the image source, official notice.

all residual claimed limitations are set forth and rejected as per discussion for claims 2, 5, 8, 9 and 20.

Allowable Subject Matter

8. Claims 6, 7, 38, 39, 56, 57, 71, 72, 78, 79, 84 and 85 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Contact Information

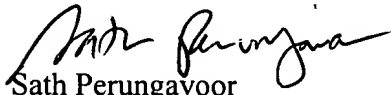
10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sath Perungavoor whose telephone number is (703) 306-4116. The examiner can normally be reached on Monday to Friday from 8:30am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta whose telephone number is (703) 308-5246, can be reached on Monday to Friday from 9:00am to 5:00pm. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

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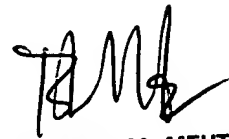
system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Sath Perungavoor

Art Unit 2625

March 15, 2005



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